pressed down, thus supporting the weight attached to the other end. This downward pressure is evidently a muscular effort, even though the movement was only a few millimeters; and the resulting values seem to indicate a greater sensibility than the pure pressure-sense would give. By having three such beams, all three of the methods used with visual impressions could be applied to this kind of touch sensations. The pressures were varied from 1 gramme to 2000 grammes. The results expressed, as those with sensations of brightness, are as follows: (1) The sensibility increases as the stimulus increases up to about 200 grammes, and from there to 2000 grammes is quite constant. (2) The sensibility is finer (*a*) with successive than with simultaneous impressions; (*b*) when muscular sensibility is added to pressure sensations, than without the latter; (*c*) when the same finger is used for the various sensations than when different fingers are used; (*d*) when the surface in contact is small than when it is large—these points holding for all the methods of experimentation as well. (3) In the method of doubles, the ratios assigned as the double decrease as the stimuli increase. (4) By the method of mean gradations, the adjustments are much nearer the arithmetical than the geometrical mean. (5) On the basis of the relativity hypothesis, and assuming that with the sensation of 1 gramme all the stimulus is converted into sensation, then from 200 to 2000 grammes only .114 to .163 of it is thus converted; and a not very different result is obtainable from the other two methods when the effects of contrast are eliminated.

This research is thus in opposition to several of the accepted generalizations of psychophysics, and though some of this antagonism is more apparent than real, it will be a most delicate and difficult work to bring unity and harmony into this most perplexing field of experimental psychology. J. J.

Ueber den Rhythmus centraler Reize. Dr. R. v. LIMBECK. Archiv für experimentelle Pathologie, Bd. XXV, H. 2.

The author has reopened the question of the rhythm of muscular contractions following central stimulation. Using induction shocks and recording the results graphically, he stimulated the cortex in dogs and rabbits and the cord in rabbits and frogs directly, and the cord in frogs, toads, rabbits and doves reflexly, stimulating the N. ischiadicus on one side so as to cause contractions on the other. In contradiction to the hitherto accepted view, he found that the central system did not send out motor impulses at a fixed rate, no matter how fast stimuli were sent into it, but that, within the limits of experiment, as many impulses were sent out as were received. His rates were for the cortex 6½–13 per sec., for the cord 5½–34, and for the same by reflex stimulation 4½–19½. Faster rates, when applied, gave smooth curves. Tracings of the spontaneous tetanus of strychnine poisoning showed a variable rate of central discharge.

Ein photometrischer Apparat zu psychophysischen Zwecken. A. KIRSCHMANN. Philosophische Studien, V, 2, 1888, pp. 292–301.

Owing to the difficulties in the accurate observation of differences of sensations of brightness, such as contrast, differences in sensibility of neighboring parts of the retina, variations in accommoda-